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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,512	09/28/2000	Richard Thomas Aiken	5-11	2116

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LUCENT TECHNOLOGIES INC.
DOCKET ADMINISTRATOR
101 CRAWFORDS CORNER ROAD - ROOM 3J-219
HOLMDEL, NJ 07733

EXAMINER	
HARRY, ANDREW T	
ART UNIT	**PAPER NUMBER**
2686	4

DATE MAILED: 09/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/672,512	AIKEN ET AL.	
	Examiner	Art Unit	
	Andrew T Harry	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-31 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wong et al.* U.S. Patent 6,330,460 ("*Wong*"), and further in view of well know prior art in the filed of the invention.

As pertaining to **claims 1, 10 and 18**, *Wong* teaches a system, a transmitter and method thereof to generate a composite electromagnetic (EM) field to carry a signal to at least two terminals by directing energy in a plurality of directions, the amount of energy directed in the direction of each of the terminals being a function of the locations and acceptable receive data rates of at least two of the terminals. See *Wong*, Fig. 3, Fig. 5, and col. 6 lines 38-61.

Wong clearly indicates that the signal strength by which the terminals send and receive signals is measured and altered based on the data rate at which the terminal is transmitting and receieving. See *Wong*, col. 9, lines 5-16. While *Wong* does not state specifically that a voltage measurement is taken to measure the signal strengths, the Examiner take official notice that it would have been obvious to one of ordinary skill in the art at the time of the invention that voltage and signal strength, although not explicitly stated, actually is measured by the data rate at which the terminal operates. The stronger the signal (voltage), the higher the data rate of the

terminal, therefore in *Wong's* teachings the signal strength is, in an implicit manner, measured by voltage, and is measuring the signal strength.

As pertaining to **claims 2, 11 and 19**, in *Wong's* transmitter, system and method thereof as modified above, the function is such that a strength of the EM field at the location of any of the at least two terminals is at least as large as, but not significantly larger than, needed for that terminal to receive the signal carried by the EM field with an acceptable level of signal quality. See *Wong*, col. 8, line 54-col. 9, line 16.

As pertaining to **claims 3, 12 and 20**, *Wong's* transmitter, system and method thereof as modified above, comprises a processor (see *Wong*, Fig. 2 items 120 and 106) and is operable to:

determine for each on of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the strength, at the location of the one terminal, of EM fields previously determined for others of the terminals (see *Wong*, col. 10, line 61-col. 11, line 36);

repeat the first determining until the EM fields determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength (see *Wong*, col. 12 lines 20-67);

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined. See *Wong*, col. 6, lines 38-61.

As pertaining to **claims 4, 13 and 23**, *Wong's* transmitter, system and method thereof as modified above, includes:

each EM field being represented by on of a plurality of beam patterns (see *Wong*, col. 10 lines 61-65);

the first determining comprises determining for each one of the terminals a beam pattern that would have to be generated for the one terminal in order to provide an acceptable receive signal strength thereat, the determining taking into account the EM field strength, at the location of the one terminal, of beam-patterns previously determined for others of the terminals; and

the repeating comprises repeating the first determining until the beam-patterns determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive signal strength. See *Wong*, col. 12, lines 20-67.

As pertaining to **claims 6,15 and 25**, *Wong's* transmitter and method thereof as modified above, wherein one of a plurality of weight vectors corresponds to each of the beam-patterns (see *Wong*, Fig. 3, and col. 11, lines 36-67, the signal strength of each beam (weighting factor) is determined by taking into account both the distance of the mobile from the base station and the desired data rate of the user) and the second determining comprises:

determining a composite weight vector using the plurality of weight vectors, and a nulling factor;

determining a composite beam-pattern using the composite weight vector, the composite beam-pattern representing the composite EM field; and

determining the amount of energy to be directed in the direction of each of the terminals based on the composite EM field. See *Wong*, col. 12, lines 20-67.

As pertaining to **claims 7, 16 and 26**, *Wong's* transmitter and method thereof as modified above, includes a processor (see *Wong*, Fig. 2 items 120 and 106) operable to:

determine for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat if that one terminal was the only terminal that needed to receive the signal;

determine a scaling factor for each EM field such that each EM field, associated with the at least two terminals, scaled by its scaling factor provides an EM field strength at the location of each of these at least two terminals that is substantially equal to its adequate receive strength;

scale each EM field, associated with the at least two terminals, by its scaling factor; and

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined. See *Wong*, Fig. 3, and col. 12, lines 20-67, col. 13+ also contain various details regarding *Wong's* process.

As pertaining to **claims 8, 17 and 31**, in *Wong's* process as modified above the direction is clearly an azimuth direction. See *Wong*, Fig. 3.

As pertaining to **claims 9, 27 and 28**, *Wong's* method as modified above clearly includes transmitting the signal/energy to the terminals via a phased array antenna. See *Wong*, Fig. 3, and col. 6 lines 38-61.

As pertaining to **claim 21**, in *Wong* as modified above, the processor is located in the transmitter. See *Wong*, Fig. 2.

As pertaining to **claims 5, 14 and 24**, *Wong's* transmitter and method thereof as modified above, includes:

the beam-patterns being energy dependent beam patterns;

the acceptable receive strength being an acceptable received energy; and

the adequate receive strength being an adequate receive energy. See *Wong*, Fig. 3, Fig. 5, and col. 6 lines 38-61.

Wong clearly indicated that the signal strength by which the terminals send and receive signals is measured and altered base don the data rate at which the terminal is operating. See *Wong*, col. 9, lines 5-16. While *Wong* does not state specifically that a voltage measurement is taken to measure the signal strengths, the Examiner take official notice that it would have been obvious to one of ordinary skill in the art at the time of the invention that voltage, although not explicitly stated, actually is measured by the data rate at which the terminal operates. The stronger the signal (voltage), the higher the data rate of the terminal, therefore in *Wong's* teachings the signal strength is, in an implicit manner, measured by voltage.

As pertaining to **claims 22 and 29-30**, *Wong* as modified above teaches that the system on which his invention is implemented is a CDMA based wireless communications system with base stations and mobile terminals. See *Wong*, Fig. 3, and col. 6 lines 38-61.

However, *Wong* does not explicitly state where his device is implemented in the system, likely leaving this piece of information out of the disclosure because it could be placed in multiple locations in the CDMA system. The Examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time of the invention to place *Wong's* disclosure in the MSC, BSC or any other component of the system in which the device could be used effectively with a processor. This would have allowed the systems designer to use *Wong's* teachings to most efficiently use the disclosed design with any flexible architecture that may have been employed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

B. Smith et al. U.S. Patent 6,104,935 teaches a downlink beam-forming architecture for a heavily overlapped beam configuration.

C. Keskitalo et al., U.S. Patent 6,212,406 teaches a method for providing angular diversity and base station equipment.

D. Shapira, U.S. Patent Pre-Grant Publication 2003/0073463 teaches an active antenna array configuration and control for cellular communication systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Harry whose telephone number is 703-305-4749. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 703-305-4379. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

ATH

CHARLES APPIAH
PRIMARY EXAMINER